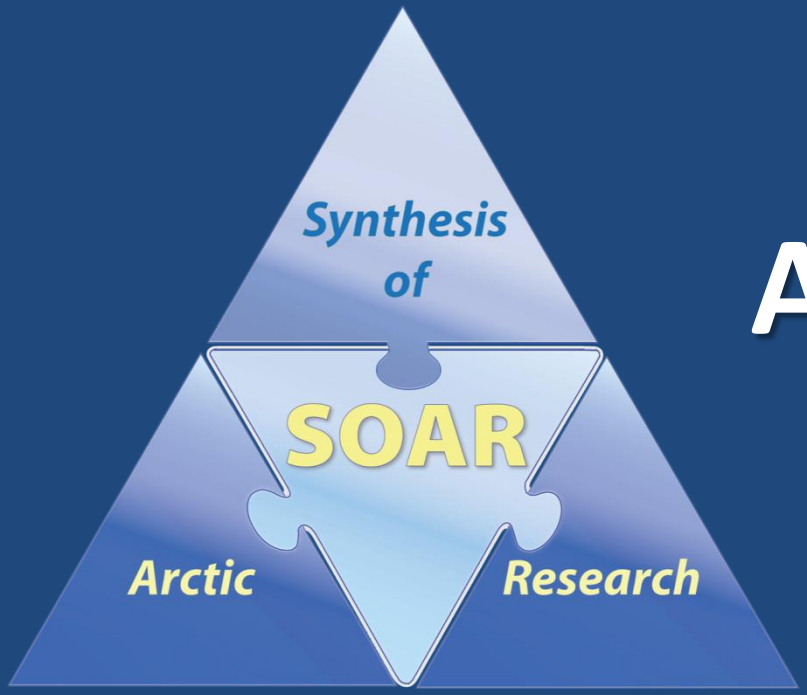


Synthesis of Arctic Research (SOAR)

Sue Moore, NOAA/NMFS

Phyllis Stabeno, NOAA/OAR

Lisa Guy, NOAA/JISAO

Heather Crowley, BOEM/Alaska Region

BOEM

Bureau of Ocean Energy Management

OUTLINE

SOAR

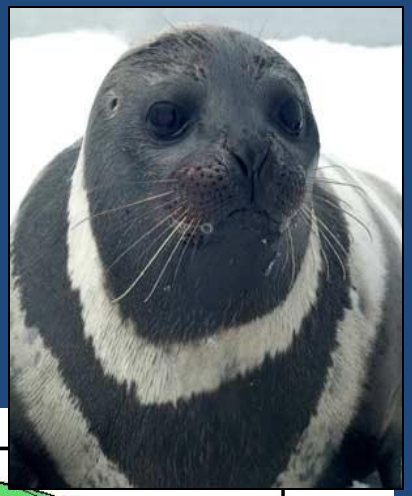
-BACKGROUND

-OVERVIEW

-CONTEXT

-TIMELINE

-LINKS TO PacMARS



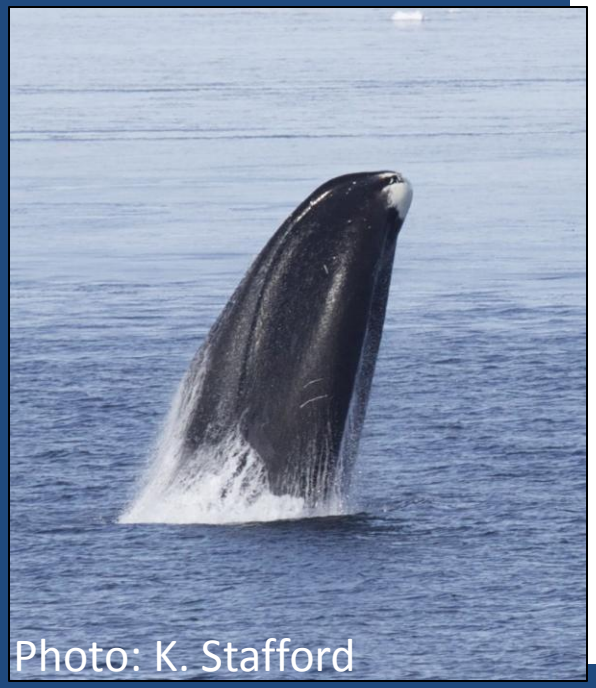


Photo: K. Stafford

SOAR BACKGROUND

The COMIDA Workshop

In preparation for possible oil and gas exploration in the Chukchi Sea, BOEM (formerly MMS) conducted the Chukchi Offshore Monitoring in the Drilling Area (COMIDA) planning workshop **1-3 November 2006**, in Anchorage.

More than 100 workshop participants identified potential monitoring tasks for a COMIDA field effort, including:

- Chemical and hydrocarbon monitoring
- Physical oceanography
- Potential impacts on benthic organisms, fish and birds
- Characterization of the ecosystem
- Distribution and abundance of marine mammals: tagging, aerial surveys, acoustic assessments
- Impact assessment for subsistence hunting

More than **$25 M** in BOEM funded research evolved directly from the COMIDA Workshop.

SOAR BACKGROUND

The Development of SOAR

2009 – Idea developed by BOEM scientists (for the FY 2011 Studies Plan), in recognition of more than **$50 M** invested by BOEM in marine mammal and related physical, chemical and biological oceanography studies in the western Arctic between 2005 and 2015.

Recently completed and ongoing studies include:

- Bowhead Whale Feeding Variability in the Western Alaskan Beaufort Sea: Satellite Tracking of Bowhead Whales & Oceanography and Feeding (BOWFEST)
- Ecosystem Observations in the Chukchi Sea: Passive Acoustic Detection and Monitoring of Endangered Whales in the Arctic & Biophysical Mooring and Climate Modeling (CHAOZ)
- Distribution and Relative Abundance of Marine Mammals in the Chukchi Sea the Fall Migration of Bowhead Whales in the Beaufort Sea (BWASP & COMIDA aerial surveys)
- Walrus Habitat Use in the Potential Drilling Area
- Pinniped Movements and Foraging: Bearded Seals
- COMIDA CAB
- Hanna Shoal Ecosystem Study
- Arctic marine research studies supported through NOPP and many others

SOAR BACKGROUND

INTERAGENCY AGREEMENT

May 2011 - BOEM and NOAA signed a 5-year Interagency Agreement to support a synthesis of scientific information drawn from completed and ongoing marine research in the Pacific Arctic region.

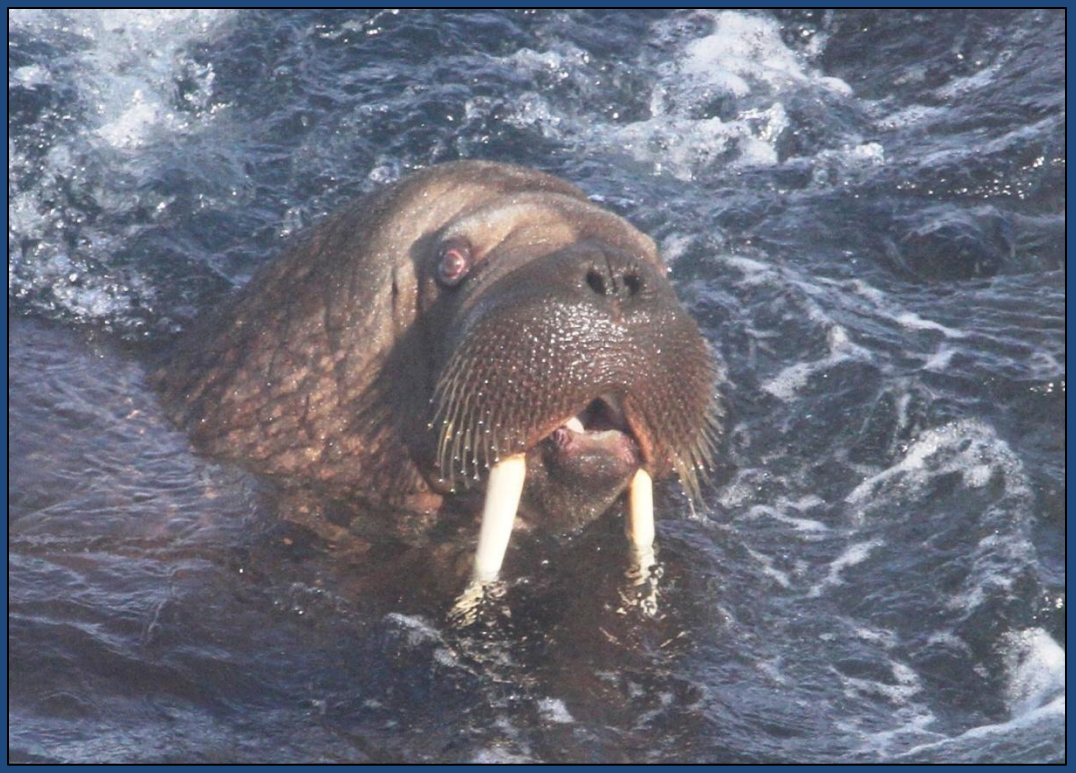


Photo: T. Sullivan

SOAR OVERVIEW

- **WHAT:** *inter-disciplinary synthesis of marine science data and observations for the Pacific Arctic Region (PAR)*
- **WHERE:** *focus is US waters of the PAR, but integration of information from Canadian and Russian studies is encouraged*
- **WHY:** *lots of marine research in PAR, but little integration and synthesis*
- **WHEN:** *5-year project (2011-2016), in 2 Phases (Phase 1 = 2011-13)*
- **WHO:** *guidance - 11 member Science Steering Committee + PIs*
  ***BOEM-funded Project** – Heather Crowley (COR)*
  Project Coordinator - Lisa Guy
  Project Management - NOAA/PMEL; NOAA/Fisheries S&T
  Integration and Synthesis - multiple laboratories

http://www.arctic.noaa.gov/soar/

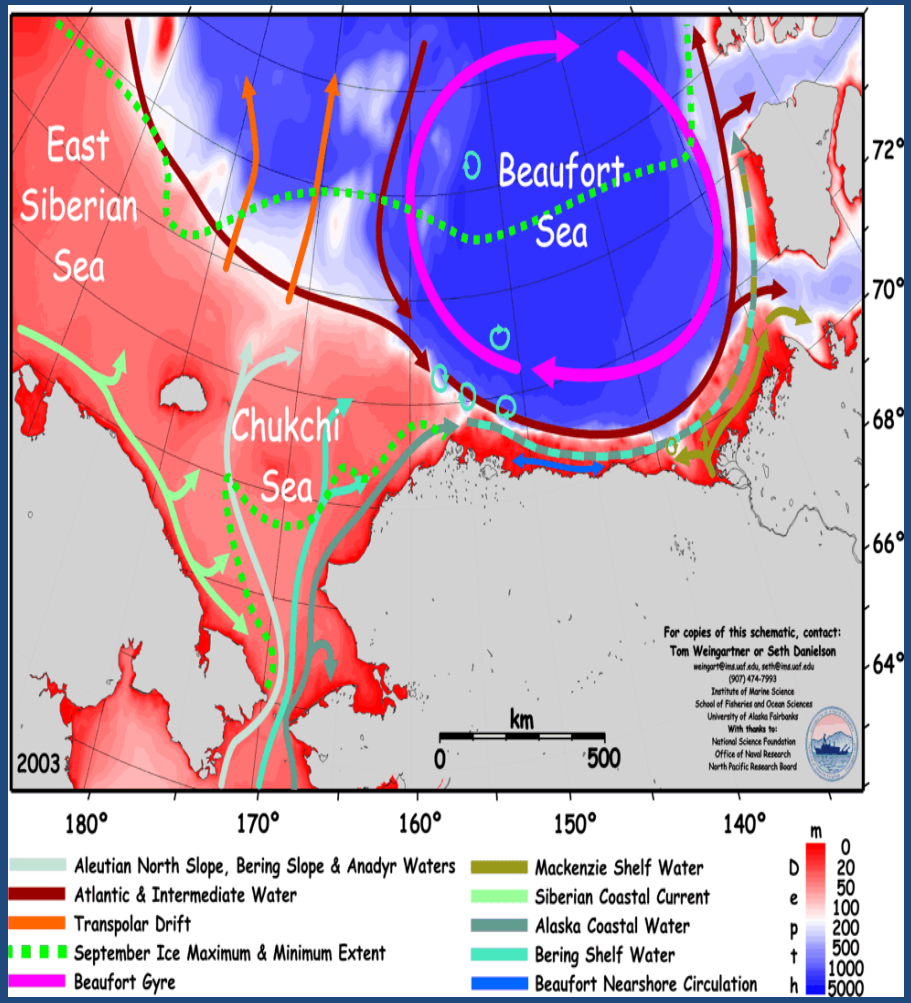
SCIENCE STEERING COMMITTEE

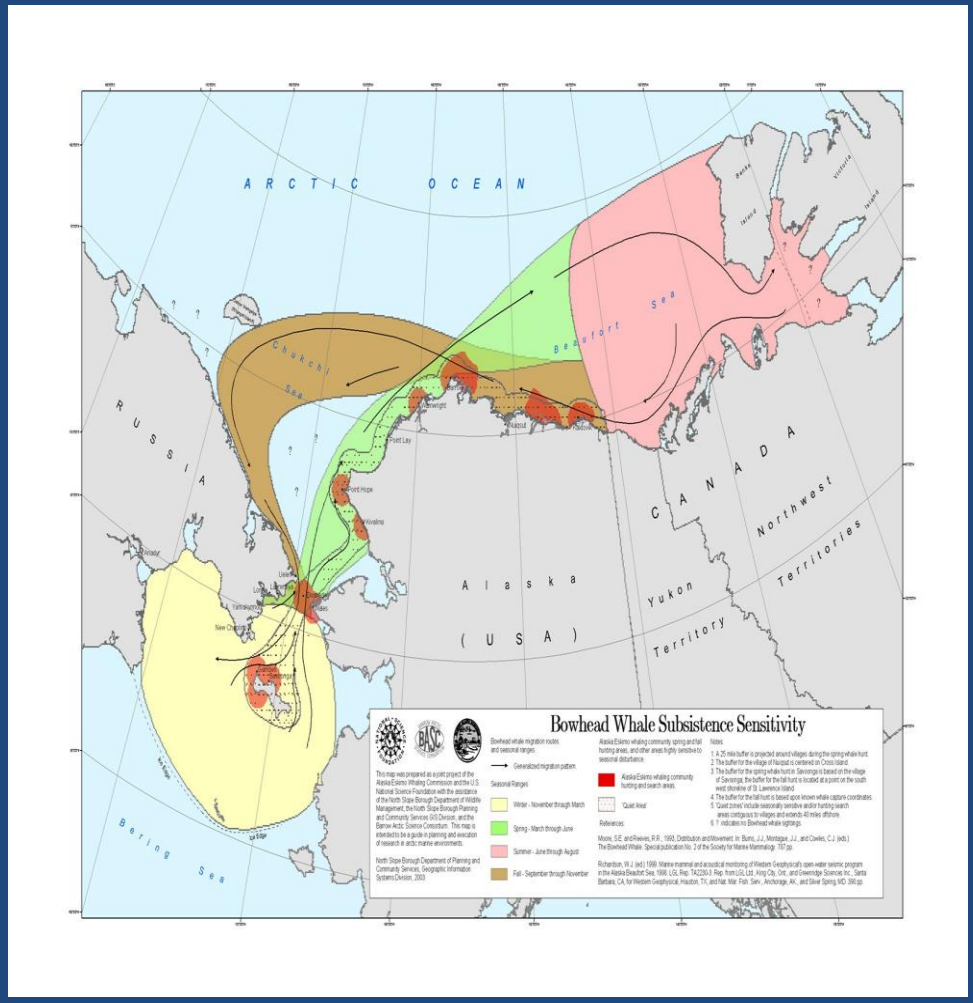
Project PIs: Moore & Stabeno

- **Robyn Angliss**
  Deputy Director, NOAA National Marine Mammal Laboratory, Alaska Fisheries Science Center
- **Carin Ashjian**
  Senior Scientist with Tenure, Biology Research, Woods Hole Oceanographic Institution
- **Chris Clark**
  Director, Bioacoustic Research, Cornell University
- **J. Craig George**
  Senior Wildlife Biologist, Department of Wildlife Management, North Slope Borough
- **Jackie Grebmeier**
  Research Professor, U.of Maryland Center for Env.Science; Arctic Ocean Sciences Board, Internat'l Arctic Science Committee
- **Taqulik Hepa**
  Director, Dept of Wildlife Management, North Slope Borough
- **Chad Jay**
  Research Ecologist, Alaska Science Center, U.S. Geological Survey
- **Vera Metcalf**
  Executive Director, Eskimo Walrus Commission, Native Representative, Marine Mammal Commission
- **Tim Ragen**
  Executive Director, Marine Mammal Commission
- **Robert Suydam**
  Senior Wildlife Biologist, Department of Wildlife Management, North Slope Borough
- **Tom Weingartner**
  Professor, Physical Oceanography, School of Fisheries & Ocean Sciences, Univ. of Alaska, Fairbanks

Pacific Arctic Region (PAR)

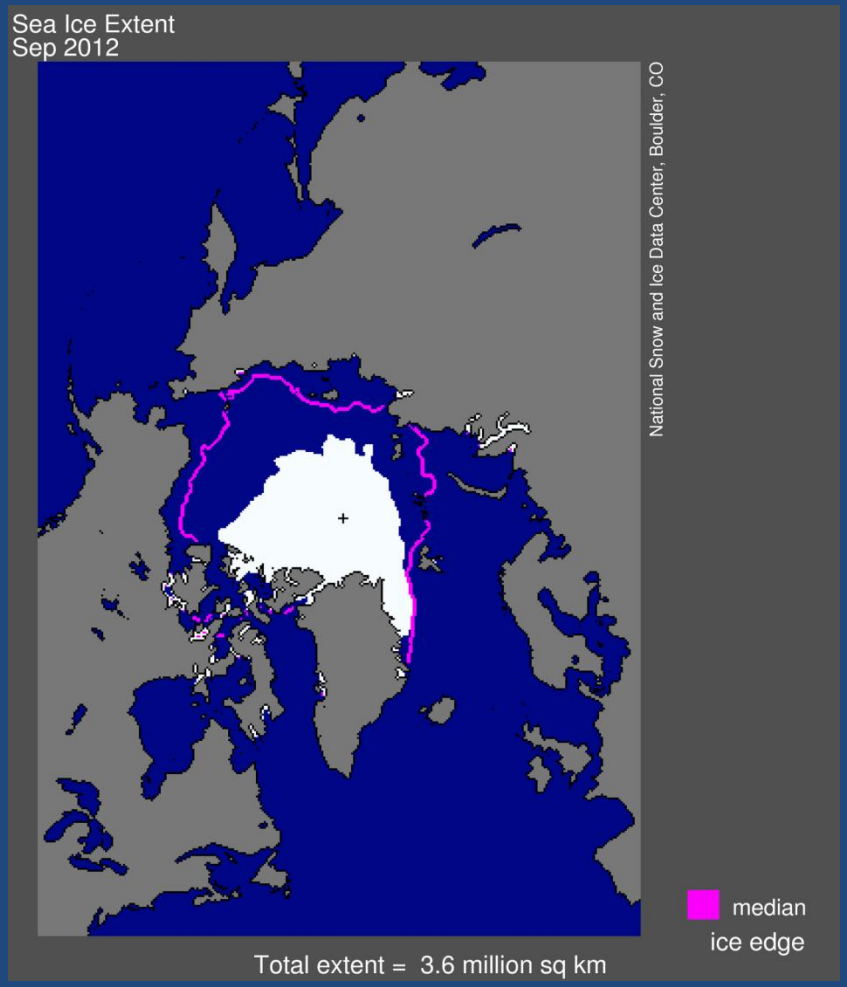
N. Bering, Chukchi, Beaufort Seas

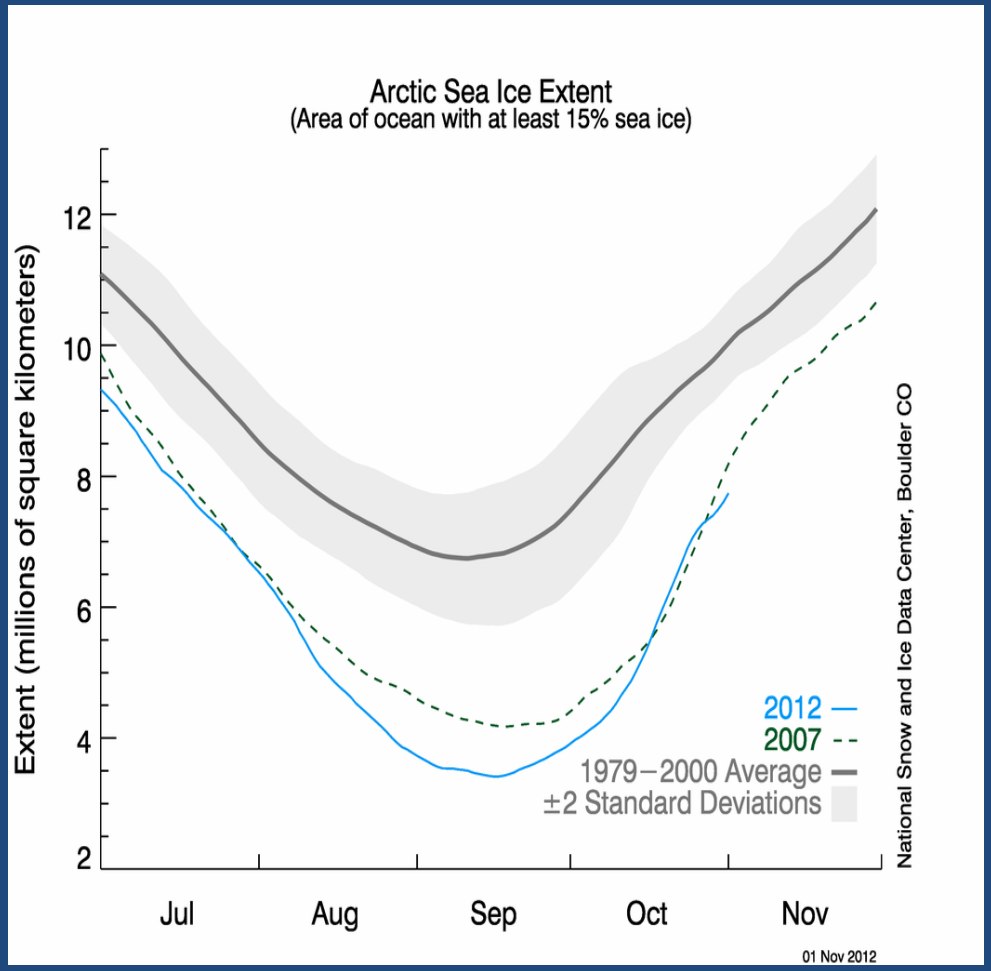




SYNTHESIS of Science: from Physics & Chemistry to Biology & Local Communities

SOAR CONTEXT - SEA ICE: extreme retreats & late freeze-up

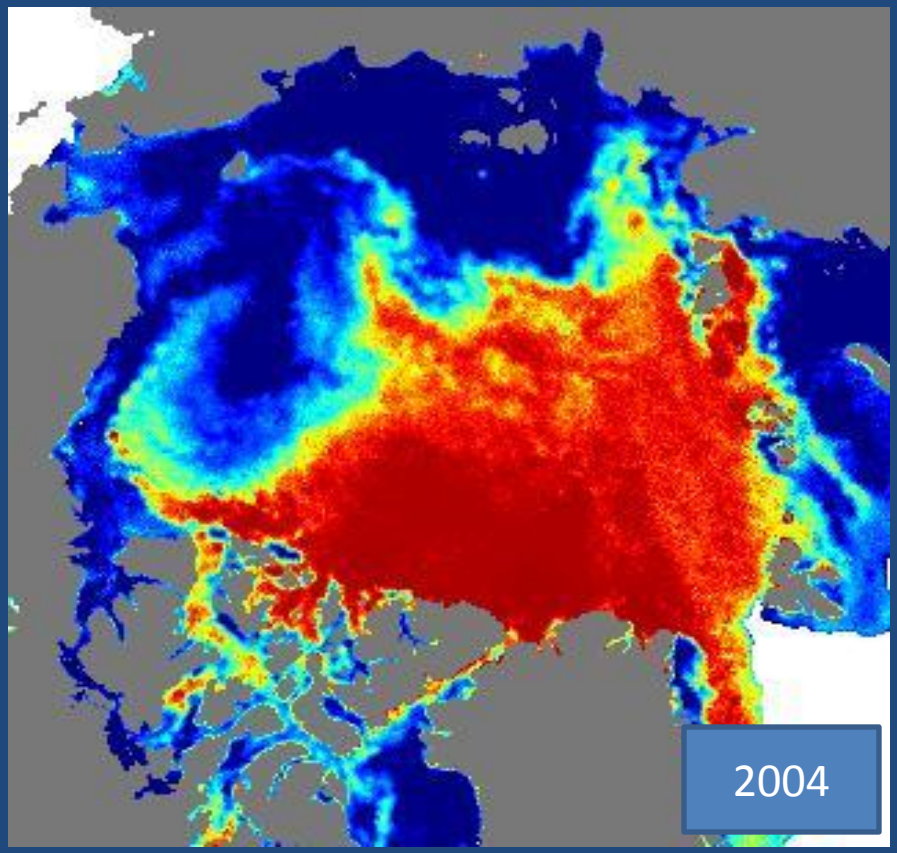


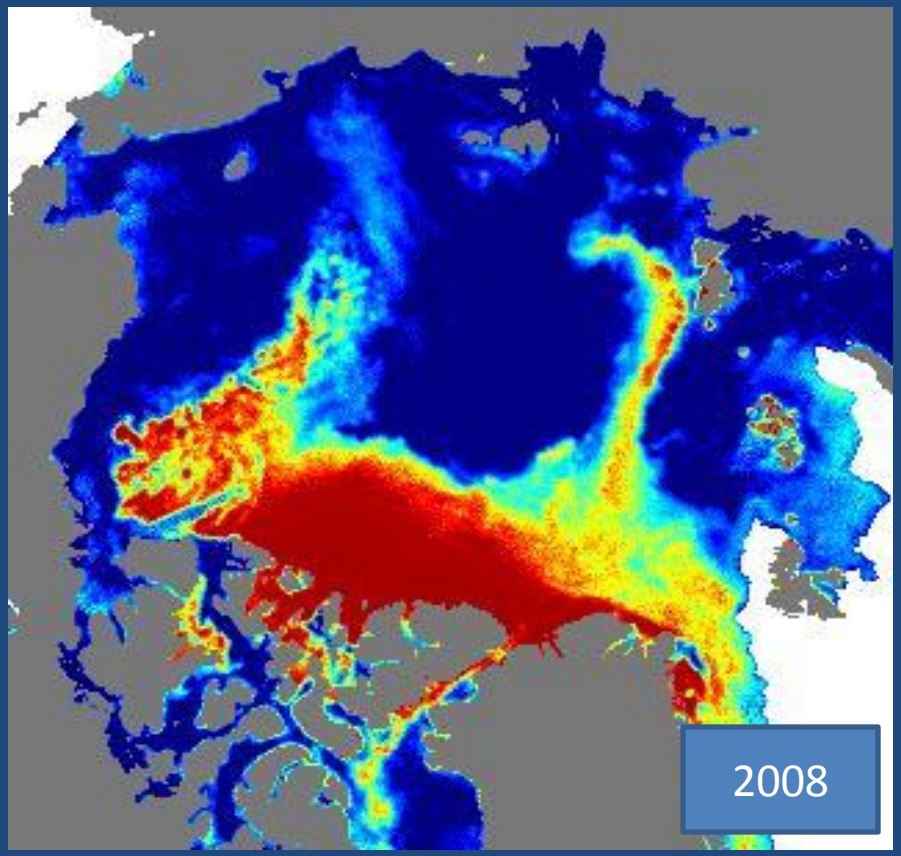


More on 'New State' of the Arctic: **http://www.arctic.noaa.gov/reportcard**

SEA ICE - Loss of Multi-year (thick) ice

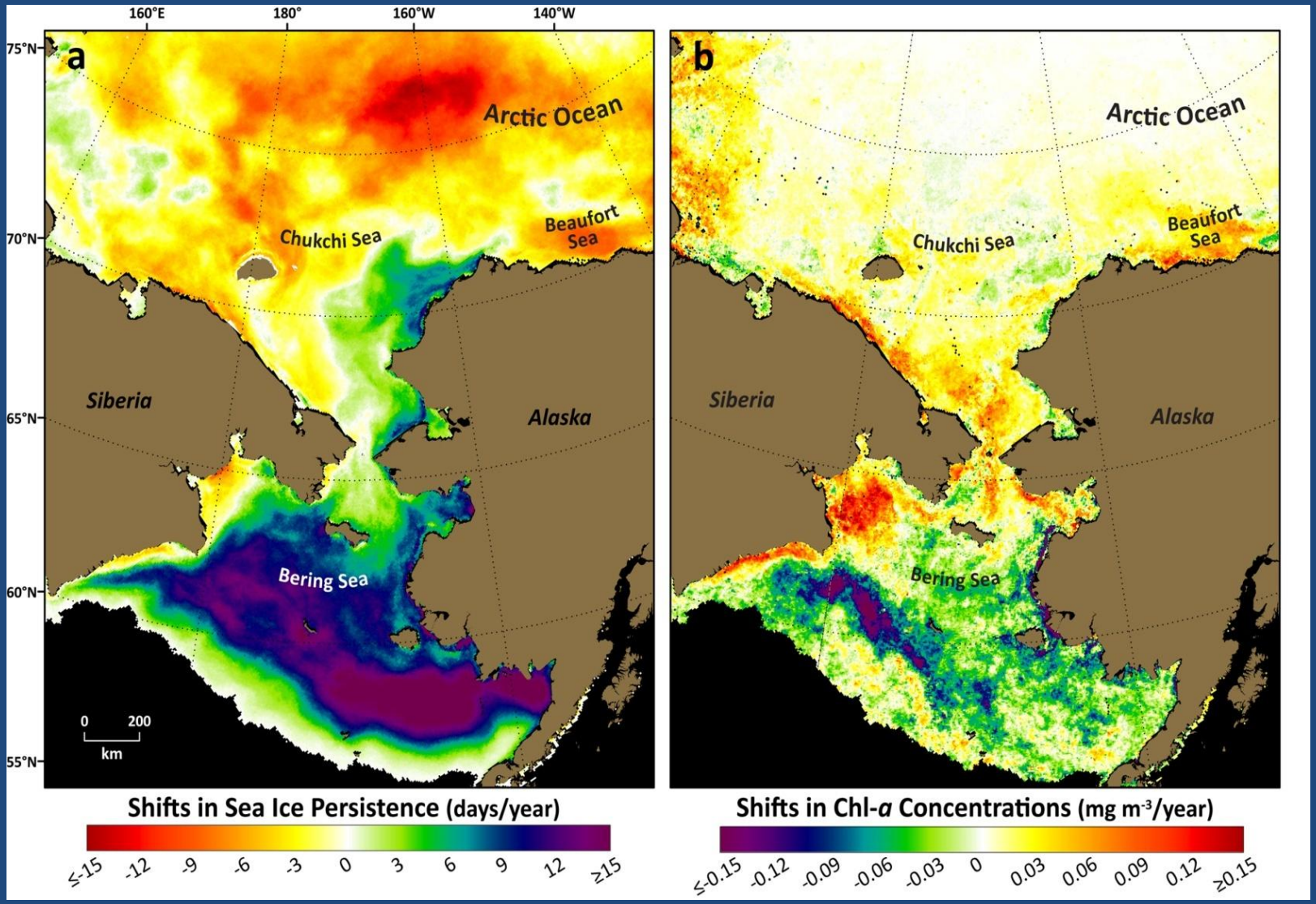
New Normal = less ice, thinner ice, more light to upper ocean (D. Perovich, *EoS* Dec 2011)





JANUARY Satellite Data (QuickScat) Ron Kwok (JPL; *JGR* 2009)

SOAR CONTEXT - Primary Production +20%, but changes have not 'tracked' sea ice loss everywhere



Satellite data 2003-09; courtesy Karen Frey

THREE SCIENCE THEMES

Result of Science Workshop, March 2012

1. Hotspot Mechanisms & Trophic Dynamics
2. Year in the Life of Selected Seabirds and Marine Mammals
3. Responses to Step-change in Physical Drivers of the Marine Ecosystem

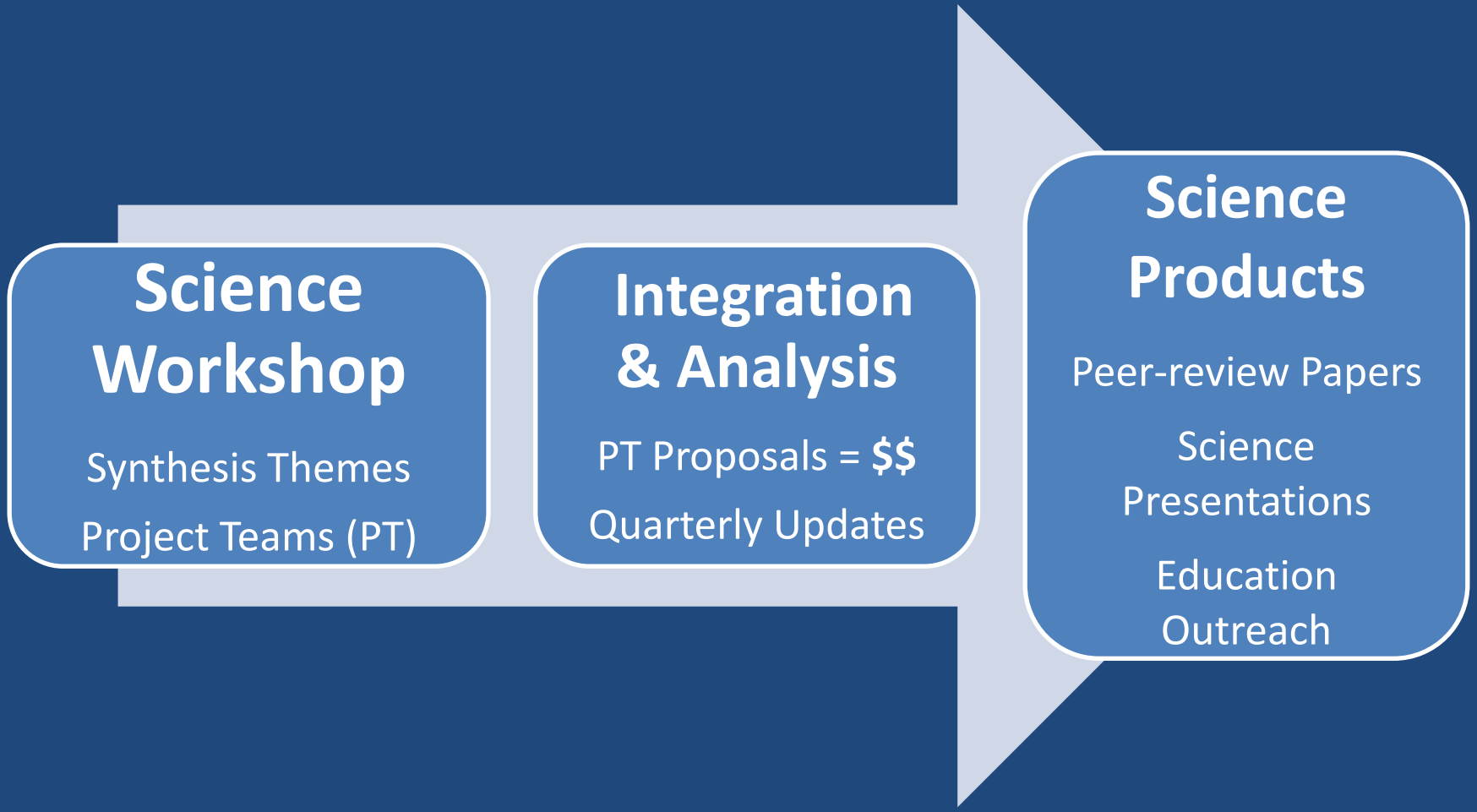
- 20 projects proposed for synthesis @ Workshop
- 14 projects are moving forward in SOAR, Phase I
- A LIST of Manuscript titles, authors & abstracts to be submitted to *Progress in Oceanography (PiO)* Editors next month

SOAR PROJECT TIMELINE

*we are here

2011	Establish and convene Science Steering Committee (November)
2012	Conduct SOAR Science Workshop: 14-16 March 2012
	Refine synthesis themes & questions
	Form Project Teams based on themes & questions
	Identify required data, analysis, and modeling for each theme
	Project Teams submit proposals: PoP = **1 AUG 2012 – 31 DEC 2013**
2012-13	***Project-based meetings and/or integrative workshops**
	SSC annual meeting; review project status & timelines (pre-AMSS)
2013	Draft Science Manuscripts submitted (target = June)
2014	SOAR papers published in *PiO* Special Issue; present and communicate science products; annual SSC meeting
	Initiate or Augment Project Team funding for Phase II
2015	Annual meeting; Present and communicate science products
2016	SOAR Phase II findings published in scientific journal (s)

2012-13: Key Milestones



SOAR = Opportunity

- Opportunity to **THINK** about what can be learned about the marine ecosystem by ***synthesis*** of data & observations across disciplines
- **$**upport for **ANALYSIS & PUBLICATION**
- Opportunity in Phase II for follow-up on **QUESTIONS** that arise during Phase I
- Opportunity to improve **UNDERSTANDING** of the marine ecosystem in support of future science, community support and resource management

SOAR –*LINKS*- TO PacMARS

pre-AMSS Joint Science Meeting: 20 January 2013

- SOAR is not the only Synthesis in town!

- PacMARS (**Pac**ific **M**arine **A**rctic **R**egional **S**ynthesis)
  - NPRB-funded effort
  - 1.5 year timeline
  - Data Synthesis & Research Needs
  - http://pacmars.cbl.umces.edu/

SOAR = Slow & Focused

PacMARS = Fast & Broad

BOTH = seek best-possible synthesis of information for the Pacific Arctic marine ecosystem

Photo: K. Kuletz